

**Denton A. Cooley interviewed by Donald A. B. Lindberg on March 30, 2010, in Houston, Texas**

["A Conversation with Denton A. Cooley"]

Lindberg: Well, thank you very much. I appreciate you taking the time to be with us. I think I explained to you earlier that the National Library of Medicine, of course, is the biggest medical library in the world, and so it's the biggest history of medicine library as well. We have collected just recently the personal and professional papers of Adrian Kantrowitz -- former colleague of yours, of course.

Cooley: Yeah.

Lindberg: And Katrin DeBakey has given the contents of Michael DeBakey's office at home and the attic and library and so forth, so that's pretty large, and we're organizing that also, but our aspirations extend to maybe going as far as the history of cardiovascular surgery in the United States and in that history, you're a very prominent part, so I'm for many reasons grateful to you for sparing the time in, of course, what's still a very busy day for you. So if we can get a little bit of a record of your remembrance of these things and your views of the future as well.

We started talking -- you started talking actually, and I already knew that you had participated at Hopkins in the first of the blue baby operations. That was an amazing piece of good fortune. I wonder if you'd say just a few words about that?

Cooley: Well, I had just completed -- I had just graduated from Johns Hopkins Medical School in August of 1944, and I became an intern under Dr. Alfred Blalock, and Dr. Blalock and Dr. Helen Taussig collaborated on a concept of treatment of cyanotic congenital heart disease, usually Tetralogy of Fallot, and they conceived the idea that if they could increase the circulation of blood through the lungs, they could overcome the cyanosis. So it was using one anomaly to correct another anomaly. It was strictly palliative surgery, but very monumental and historic procedure.

Lindberg: It's a brilliant idea. But how many people would have loved to have been the intern in that operating room? What was an intern doing then? Were you holding the sticks as usual?

Cooley: Well, I was an intern. I'd sort of foot of the table holding the retractor and so forth.

Lindberg: Holding the retractor. Well, that's a good thing for an intern to do.

Cooley: In those days, blood-banking was in its infancy, and I was in charge of blood-banking, too, for the surgical service, so I had done the cross matching of the child with the blood that we had available.

Lindberg: So you could do ABO and positive/negative, that's about it, right?

Cooley: Oh, yeah.

Lindberg: We really didn't know any more than that, did we?

Cooley: Oh, yeah, that's right, before Rh factor and all that came into being. We just did the --

Lindberg: Well, ABOs were only known since about '41, isn't that so?

Cooley: I think that's true, yeah.

Lindberg: Yeah, that was the infancy of a lot of things.

Cooley: It was new. It was considered rather risky to do blood transfusion even then.

Lindberg: Absolutely. In fact, well, they're still just getting past direct blood transfusions. Actually, my mother had a direct blood transfusion from my father. The worst conceivable donor, of course, for a woman. But anyway -- But then you studied with Dr. Blalock. What was that like? What kind of a teacher was he?

Cooley: Well, after that I decided I had my interest in cardiovascular surgery, and I thought it was the dawn of heart surgery, and I was privileged to be there to witness the event and had a chance to be a participant in cardiac surgical development since that time. After that, we had just a deluge of blue babies coming from around the world, and I think that I participated in maybe 75 of those operations before I went into the service on active duty in January of 1946, and I spent two years in the service then and returned to Johns Hopkins for two years to finish the training there.

Lindberg: What was the training like? How did Dr. Blalock approach it?

Cooley: Well, Dr. Blalock was more as a mentor and a role model, because he let the residents do a lot of the surgery there, and that was one of the great characteristics of the training program at Johns Hopkins was that surgeons in training got to do a lot of surgery independently, and Dr. Blalock knew about what we were doing, and he trusted us with a lot of work we probably weren't quite mature enough to undertake.

Lindberg: Was he himself [Blalock] a skillful operator?

Cooley: I would not say he was particularly skillful. I think he was a determined and methodical type of technician. It's kind of interesting looking back on the history a very skilled technician was a man named Vivien Thomas, a black man who was from the --

Lindberg: I've heard of him, yeah.

Cooley: -- what we call the dog laboratory, but I think one of the skillful surgeons that was somewhat senior to me was the first assistant to Dr. Blalock on that operation -- a man named William Longmire who headed up the department of surgery at UCLA -- looking for a real skillful surgeon and I think Bill Longmire was more skillful than perhaps Dr. Blalock, even.

Lindberg: Well, of course, there's the decision making and the courage as well as the skill. I had the privilege of operating with Blakemore at the Presbyterian when I was a house officer and, of course, he had fingers missing and all the rest and some of the procedures we did -- you know, most didn't want to operate after him. But he had the concepts to try to wrap stainless steel around the aortic aneurysms and so forth --

Cooley: Well, you had a Blakemore tube.

Lindberg: -- since Dr. Blakemore, yeah. Yeah, inventive.

Cooley: Yeah, Dr. Blalock and Dr. Blakemore were roommates and students at Johns Hopkins.

Lindberg: Were they? I didn't know that. This was a lovely man. I remember very much his surgical teachings, but he wasn't as you suggested a skillful operator, per se, but a man with ideas and a little courage.

Cooley: I remember Dr. Blakemore visited Johns Hopkins and Dr. Blalock asked me to show him around the institution and so on. I helped play host to Dr. Blakemore.

Lindberg: Well, that must have been fun.

Cooley: It really was.

Lindberg: Was he nice to you?

Cooley: Very nice, yeah, perfect gentleman.

Lindberg: Well, I recall him tolerating interns and residents and students and just made us sit down at the table and let's talk. I loved that. That's I think a marvelous approach to surgery, separate from the suturing, the manipulations. What do you think is going to -- just jumping way ahead, what's the future of surgery now? Are they going to replace surgeons with robots or something?

Cooley: Well, we seem to be in a rather critical stage now. We don't know how far the federal government will get involved in health care with President Obama's success in passing his reform program, but I think we're going to see conventional cardiac surgery change quite a bit as we have new emphasis on techniques with limited access procedures and using laparoscopic techniques, and then the robot, an extreme of that effort.

Lindberg: Yeah, I was thinking not of the politics of it, but as you're suggesting what's actually possible and sensible. I mean surgery technique is always changing. These little pop-up valves you can put in through the vessels, that's an amazing thing.

Cooley: Oh, yes.

Lindberg: Have you seen that?

Cooley: Angioplasty and stents and everything is an interesting technique. It now seems to be really replacing a lot of the conventional procedures that we'd done in the past with open surgery. But I think that as in every sort of evolution that we see in treatment of disease, there'd be something lasting from the initial efforts of the pioneers in cardiovascular surgery developed.

Lindberg: Yeah, well, I mean you changed the techniques very radically yourself, so keep on going.

Cooley: I did.

Lindberg: In that vein, you have on the wall some photographs of Williston who is interested in the genetics of cardiovascular disease. What's the future there?

Cooley: Well, it's hard to determine whether that is going to be important. As far as therapy for heart disease, it's a little difficult to see how they're going to change the genetic situation much, but it might help in preventive medicine and understanding which individuals are more susceptible to cardiovascular disease in their lifetime.

Lindberg: Yeah, I was thinking just this morning that it might be possible -- conceivably with genetics or some other approach --to identify people who have got atrial septal defects.

Cooley: I think there's a possibility that they can do that, of course, with diseases like Marfan disease and so on. Even now they're trying to relate genetics to breast cancer and other prevalent diseases, and whether that will be useful in the future, we'll have to wait and see.

Lindberg: Yeah, preventing cancer by doing mastectomies that's a pretty amazing thing to consider.

Cooley: Yeah, it may be a possibility.

Lindberg: Yeah, well, I mean it's happening. I don't know if it's right or wrong, but some women are making that decision.

On the wall, too, and this is a wonderful museum. I have to say. It's really a joy, and we're going to come back and spend more time, but one of the exhibitions shows the various devices that you helped develop and that were important to you in the course of doing the special surgery. Surgeons always have devices, don't they? I mean that's just part of the game, to invent a better thing. Is that still going on?

Cooley: Well, I think so. Right now the real challenge is to substitute for the native heart, and in our laboratory here, we're working very actively in developing these left ventricular assist devices, and even in the development of a total artificial heart, a mechanical heart.

Lindberg: Aren't the ventricular assist devices quite successful?

Cooley: Yeah, they are, but there are still some flaws involved, and we're not sure whether we need to duplicate the pulsatility, a pulsatile nature or whether we're going to have a continuous flow total artificial heart or not. If we can prove -- and that is one of our strong efforts here -- if we can prove that the human body doesn't require a pulse to supply all the organs, the kidneys and liver and so on, that would be a great breakthrough towards having a total mechanical heart.

Lindberg: I guess I was jumping ahead in assuming you'd already proven that. But I guess it's still an open question for you isn't it?

Cooley: Well, we have patients with so-called left ventricular assist devices that completely eliminate the pulsatility, and the patients seem to be doing perfectly well, but we still have to prove in the laboratory and experiments on animals, that this is a permanent sort of condition that is really tolerable for the physiology of all of our organs.

Lindberg: It isn't like proving that hummingbirds can fly is it, since you already have some successful patients. Are there devices from that wall that you're particularly proud of developing?

Cooley: Well, some of them I'm proud of. When we introduced open-heart surgery, and I think the real fountainhead was in Minnesota with the group over at the University of Minnesota and also John Kirklin over at the Mayo Clinic.

Lindberg: So Kirklin and [C.Walton] Lillehei.

Cooley: But the real key to open-heart surgery, which really opened the door, was development of a simple method of oxygenating the blood, and the problem in extracorporeal circulation was to substitute for the lung. Pumps are pretty simple to make mechanically. So pumps weren't the real challenge but the oxygenator was, and the bubble oxygenator was introduced very early in the 1950s, and that led to the possibility of us doing open-heart surgery. So we had a bubble oxygenator here, and I think we very quickly established an open-heart program beginning in 1956 and within six months it was still available, and that year we did over 100 open-heart operations, far more than anybody else in the world.

Lindberg: It is a lot. Use of that device lead to a lot of frothing and hemolysis though, too, didn't it?

Cooley: Oh, yeah. It was a lot of things -- you had to overcome your bubble -- the blood, of course, you'd get a foam. It's manageable but we had to use --

Lindberg: Silicone.

Cooley: Silicone, remember that?

Lindberg: Oh, yes, very well.

Cooley: To de-bubble the blood and so on. I just wondered what happened to all that silicone. It's in patient's brains and so on.

Lindberg: Yes, we used too much at Presbyterian. I was a pathologist for quite a number of those cases. I can assure you, it was very widespread.

Cooley: Oh, yeah.

Lindberg: We were using a Kay-Cross oxygenator, these parallel disk things. What kind of one did you use?

Cooley: Well, the Kay-Cross was less traumatic, we'll say, to the blood, but it wasn't as efficient as the bubble.

Lindberg: Right, so they'd turn up the speed and you'd get even worse hemolysis.

Cooley: Part of the function of the lungs, of course, is not just to absorb oxygen, but also to get rid of carbon dioxide, and the bubbler was much more effective in getting rid of the carbon dioxide than the disk oxygenator.

Lindberg: Right. What's used now?

Cooley: What do I use now?

Lindberg: Yeah.

Cooley: Now we have membrane oxygenators. These membranes more or less mimic what's going on in the human lung. There's a semi-porous membrane with some synthetic material making up the membrane, and so the oxygen comes in contact with the blood, but the blood is in a membrane and it's protected from the trauma and turbulence that goes with the bubbler. But these membrane oxygenators now have more or less replaced any other type of oxygenator we had. Nowadays -- in those earlier days, we rarely in our institution kept a patient on the pump for more than 30 minutes. Today, surgeons take three or four hours sometimes with the open heart.

Lindberg: Do they add chilling to that? Reducing the body temperature?

Cooley: Yes. Hypothermia, reduction of temperature has played an important role.

Lindberg: So again these surgical techniques just get better and better don't they?

Cooley: Yes, I think so.

Lindberg: I'm wondering in the institute you founded, you made a particular emphasis not just on doing the surgery and helping the patients but also in research and teaching. What's the best way to be sure all that continues? What's the way to fund that? That's expensive.

Cooley: Well, it has been a problem from the beginning, because we found out very early that research and education did not bring in money, so we've had to rule out -- I must say, St. Luke's Hospital has been reasonably supportive of us. They now support about 40 percent of our budget,

but we have to go out and look at philanthropy. Fortunately, Houston is a very philanthropic city, but also grants and contracts of various types to support our research program.

Lindberg: So you've gotten -- well, of course, in the old days NIH had an artificial heart program, which they then withdrew from. Did you ever get any NIH money for artificial heart work?

Cooley: Yes, we do.

Lindberg: You do now?

Cooley: Now we do. In fact we just got a \$5,000,000 grant to support our research regarding total artificial heart with a continuous flow principle.

Lindberg: You can run through that in a hurry, though, can't you?

Cooley: It doesn't last long. Our annual budget now they're around \$18,000,000 to support all of our personnel and activities here, but it's still far less than some other older established institutions.

Lindberg: Yeah, from the point of view of the national good, that's not so much money. You're a bargain really.

Cooley: It's about a ten-second interest on the national budget.

Lindberg: Well, that's interesting. There's another aspect that NIH and my own institution, National Library of Medicine, is taking a bit of an interest in and I wanted to invite your comment. Namely recruitment of minorities to health services, healthcare, medicine, and so forth, health profession, I guess we say. We haven't done terribly well on that. Are you doing well on that? Are you helping that? Are you worried about it at all? Any advice for us?

Cooley: Well, I'm a southern-born individual and grew up with some of the prejudices we enjoyed as young people, but then an interesting transition that's occurred with the equal rights program. Lyndon Johnson, our president, spearheaded that [equal rights].

Lindberg: He sure did.

Cooley: Today we really believe that we offer the same opportunities for all the races. I can remember so clearly when we had a black segment of care and the hospital said the separation of races entirely. It's hard to explain that to people that are young enough.

Lindberg: I remember it very well. I don't think there's any discrimination on a racial basis now in these selections for medical school residency and that sort of thing, but at least it doesn't appear that there are enough applicants to these health careers. So there are a number of programs that we support to try to keep, assure that high school students and junior high school students know about opportunities in healthcare and medicine. One of your colleagues, Bud

Frazier, has helped us by -- of course, he's an inspiring kind of a sort -- to keep the interest up from that area. Are you ever called upon, do you ever work in high school and junior high, college?

Cooley: Well, of course, we get invitations to go and speak to the students and so forth.

Lindberg: You get invitations for everything, sure.

Cooley: To see my own children and grandchildren demonstrating the change that is taking place in the school -- even so my family, daughters and grandchildren have friends of other races, black, African races and so on -- but never really closely associated.

Lindberg: Well, we're trying to -- you know the programs in Harlem that we put on and just trying to get -- just keep in mind before you get to college, just remember medicine could be wonderful for you. Just to encourage the applications to these programs such as you run, because I'm sure that you're going to pick the best person, whatever you can, whatever his or her color. But we want enough of these people trying to get there. Anyway, I just wanted to ask you about that.

I noticed in the wonderful collection at the end of the room is more and more personal of yours, as opposed to the general cardiovascular research and practice -- the award from the Cooley Surgery Society to Mike DeBakey and the picture of you two. I think people who know medicine are so happy that you did that. I wonder if you'd say a comment about that?

Cooley: Well, Dr. DeBakey and I were originally, 50 years ago, were colleagues and associates and so on and then I think in the development of my program here at the St. Luke's and Texas Children's Hospital, became sort of competitors to what was going on at Methodist Hospital. We sort of separated. We had some disagreements and so forth. And throughout 40 years of disagreement our feud continued, and I was very relieved when I had an opportunity to restore our early friendship and have a major reconciliation and enjoy it. And I enjoyed the last 12 months of Mike's life more than I did the 40 years that we were rivals.

Lindberg: So glad to hear that. I was very happy to hear it, and I think everyone who knows modern medicine was happy about it.

Cooley: But looking back on it, I think that the feud became of almost international interest. It was a stimulus to me and possibly to DeBakey, because we were in sort of a race to make these early achievements.

Lindberg: Well, competition is not all bad. Bad feeling is bad, but the competition is fine.

Cooley: I like to tell the story that we had Gene Cernan as a patient here. He was an astronaut, and he wrote a book, an autobiography, entitled *The Last Man on the Moon*, and he was the last astronaut to be on the moon but he said that during his experience in the space program, the cosmonauts of the Soviet program always seemed to beat us to the punch, everything from the Sputnik on down to encircling the globe and that sort of thing.



Cooley: It got to be almost a personal sort of a thing. They thought those cosmonauts were their enemy, but once the space program stopped their race to the moon and other planets, they got to be collaborators along with the cosmonauts and found out that those guys were pretty nice people, too, and they enjoyed being with them. The only difference was the cosmonauts could drink more vodka than they could.

But I was thinking about that as I was driving home one night and it occurred to me this race is over for Mike and me. I thought, well, it's time to make up in good sportsmanship and go have some sort of a renewed friendship, so I went by his house, and knocked on the door, and Mrs. DeBakey came to the door and I said my name is Denton Cooley. She said, "Oh, I know who you are, Dr. Cooley." Thank you. I said I came by to pay my respects to Dr. DeBakey. I know he has had a serious operation and was having a difficult recovery and I would like to just pay my respects to him, and she said, "Well, I'm terribly sorry, but he is very fatigued today, had a rather busy day, but maybe we could arrange some other time." Well, that made it possible for a couple of our mutual colleagues to arrange for Mike to meet me, and we had a sort of official thing by inviting him to be a member of my surgical society, and then a month or so later, he reciprocated and made me a member of his society.

Lindberg: How wonderful. Well, I'm sure Katrin was merely looking after him. She did a good job of that.

Cooley: Right.

Lindberg: But good for you. I congratulate you for -- but it's interesting to me that you brought in a sports metaphor.

Cooley: Yeah, sportsmanship. Well, I have been an athlete in my day and played a lot of games and so on, and it's always been interesting to me -- particularly I spent a year in England and would go out and watch rugby and these guys out there trying to kill each other, but afterwards they all come into an area there and drink beer and sing songs, and they're all good friends. I feel that's sort of part of sportsmanship to -- whether you win or lose, you try to say it's not a personal thing.

Lindberg: Yeah, there's plenty of bloodshed in rugby.

Cooley: You see them now in -- March Madness is going on in basketball. The teams will go by and shake hands, or coaches do and so forth afterward. They would be all bloodied and everything but --

Lindberg: So sports has helped you?

Cooley: Yeah, I think so.

Lindberg: I'm glad to hear that.

Cooley: I think I was a little bit better sportsman than Mike DeBakey.

Lindberg: I don't think he had any interest whatever.

Cooley: He had no interest there. One of the reasons why I separated from Mike was I felt that he was too abusive of all of his residents and medical students and so forth, and I didn't think I could be permanently involved in that environment. I was always --my image was -- my impression was that Dr. Blalock at Johns Hopkins had a friendship with all of his residents. He respected them and protected them and --

Lindberg: You've been quoted as saying that this kind of surgery is team--

Cooley: Teamwork, yeah.

Lindberg: So, I guess, you really believe that?

Cooley: Oh, I think so.

Lindberg: You spoke about the fellow commanding a space missile, space rocket, that hundreds of people designed and built and launched and cared for. And on a slightly smaller scale, surgery is that way. They're depending on a lot of other people.

Cooley: Of course. The teamwork is not -- you have a captain, perhaps, who is usually the surgeon, and think of all the support that he gets the anesthesia and nursing service.

Lindberg: Blood bank, even, yeah. The blood bank has changed a whole lot since the days you were speaking of. I mean you were giving whole blood when you were in charge of that.

Cooley: Oh, yeah.

Lindberg: But they don't do that much anymore, everything is fractional therapy. It's amazing to me, because I grew up in whole blood blood banking. Yeah. I don't want to fail to take an opportunity to hear of your contributions and your history but still I can't fail to ask you about a thing that amazes me. As an occasional visitor to Houston -- I'm probably here once or twice a year for one professional purpose or another -- and it seemed to me that one of the great achievements of American medicine was the partnership between Baylor and Methodist Hospital, which contributed so much to the growth of all of the things around it at the Texas Medical Center. That seems to have been destroyed. How can that be?

Cooley: I think it was a mistake for Baylor and Methodist Hospital to separate. In fact, I was invited to lunch with the chairman of the board of Methodist to give my opinion about it, and I told him, look, Methodist has been married to Baylor for 50 years and Baylor has been married to Methodist for 50 years, and I said neither one of you would be what you are today without the other. Why don't you get a marriage counselor? Well, personalities were such and some problem was partly economic and Baylor has, I think, suffered more than Methodist.

Lindberg: Yeah, Mike totally hated this happening. I called him once saying essentially I found one of your senior people looking for a job, what the heck is going on? He said, "Oh, let me send you my correspondence. I know what's going on. I can't stop it." I don't know, would it have mattered if you'd been together at that time, you'd had your rapprochement and sort of spoke with one voice? It probably wouldn't have changed the economics.

Cooley: I'm not sure that either he or I could stop it, but certainly he was the one that should have been able to, but that was --

Lindberg: He tried.

Cooley: Mike was the crown jewel to Methodist Hospital and to our medical center.

Lindberg: So is there a relationship now between Baylor and St. Luke's?

Cooley: Oh, yes. Baylor has moved into St. Luke's Hospital. We have the Department of Surgery here, the cardiac surgeon and the general surgeon working right here at St. Luke's Hospital. I don't know what's going to be the outcome of it all. They even started building their own hospital here.

Lindberg: And ran out of money.

Cooley: And had to stop for economic reasons. But I don't know. I think if you want to see a real change it's remotely possible that Baylor and Methodist will get back together.

Lindberg: That would be nice.

Cooley: Methodist still uses the DeBakey name in their ongoing cardiovascular program.

Lindberg: Well, it looks like a lot of people also migrated over to UT.

Cooley: True. Yeah.

Lindberg: I mean that was almost inevitable. Although I talked with Chuck Brunicardi. I had been introduced to him and his wife by Mike and Katrin. And I asked him what are you going to do. He says I'm going to go where I can do surgery. So I guess he must be with you all.

Cooley: Yes, he is. I don't see Chuck very often. He's over in the general surgery part, and ours is all cardiovascular. But Joe Coselli is one of the most prominent cardiovascular surgeons in the country. We enjoy having Joe here. He's a real nice man and very cooperative with all of our efforts. We've merged our residency program in cardiac surgery with Baylor.

Lindberg: Have you?

Cooley: That's been an important change.

Lindberg: So you've kind of helped salvage something out of all this?

Cooley: I think so.

Lindberg: I'm happy to hear that.

Cooley: I spent 19 years on full-time faculty at Baylor. All of my fees became rather substantial during those years -- all supported Baylor.

Lindberg: Sure.

Cooley: Baylor didn't have a big endowment when Mike and I were beginning there, but both of us put our fees into Baylor and kept it solvent. But I think Baylor suffered a bit when I decided to resign my faculty position.

Lindberg: Sure, undoubtedly.

Cooley: Kind of interesting looking back on the history of cardiovascular surgery. I was up at the Cleveland Clinic several months ago to give a talk, and the introduction sort of interested me. This man said, I don't know how to introduce Dr. Cooley. He said there's been so many fathers of cardiovascular surgery. Go back to --

Lindberg: Success has many fathers.

Cooley: Blalock and Lillehei and John Kirklin and so on and he said -- but decided he couldn't be the father. We already have about four or five fathers. Maybe he's just the midwife of heart surgery. I found that was a pretty good designation.

Lindberg: Oh, I think you're more than that. Many people say no one can do surgery on the heart the way you could. So what will happen here in Houston? Do you think -- it's hard to predict, huh?

Cooley: It is hard to predict, but I think we're going to enjoy a closer relationship with the other institutions in the medical center. Actually, now I think there are some 40 institutions represented in the medical center, and we're doing our best to provide sort of a balanced education, you know, all of our residents and rotating them through the various institutions. But it may be that we'll see a residency program emerge for the Texas Medical Center and not just for each institution.

Lindberg: Gee, that would be wonderful.

Cooley: I think it would, too, but we'll have to see.

Lindberg: Well, you'd have a bunch of applicants, I should think.

Cooley: Another thing we can't anticipate is what's going to happen under the new healthcare reform. It may take away some of the opportunities in the private practice of medicine or so-called fee-for-service.

Lindberg: Gee, I hope not.

Cooley: And it may be that so many of the surgeons and internists will be salaried to the hospital.

Lindberg: Some like that.

Cooley: That would be something like Presbyterian Hospital and Johns Hopkins and other older established programs.

Lindberg: Well, some people like that. For instance, my professor of medicine, Dr. Loeb, was a wonderful person, and he was so-called geographic full-time. Meant that he was on a salary. That's what he liked. But his chum, Dana Atchley was strictly a private practice guy, and it was just two ways to do it, saw patients with both of them. I hope that -- there's very little reform, actually, in this bill. There's a lot of talk about who's paying the insurance companies. But I hope it won't do any harm to the good systems that we have, and I hope it will in fact create a system where the 50 million people who don't have any insurance at all, get to have some. That would help all of us.

Cooley: Yeah.

Lindberg: I remember when Medicare came in, the hospital people really were behind it, and the doctors and AMA were opposed and, of course, it ended up the doctors did extremely well and the hospitals not very well.

Cooley: [indiscernible] both the doctors and the hospitals.

Lindberg: So I think there's a way to get a benefit out of this new program. I hope there will be. But I was thinking about that and asking about the education and the research, because as far as I can see the only possible funding of cardiovascular surgery research would be NIH. I mean it's not going to come from NSF. You guys, at least Mike had a way to work with NASA, maybe that's another possibility. Do you work at all with NASA?

Cooley: Well, not directly, no. I know so many of the people who are working there but we haven't had a close relationship.

Lindberg: Well, he attributed to them some skill in perfecting this pump.

Cooley: Yeah, well, I know that --

Lindberg: Reducing hemolysis, in other words.

Cooley: Yeah, well, that's always a problem. And Mike DeBakey had a patient who was a NASA engineer, and he suggested to the patient that he develop a pump, which later was known as the DeBakey pump, and we have not had that close relationship with NASA.

Lindberg: Well, you take help where you can get it. But I'm totally amazed that those pumps will work as well as they do and not just beat up the red cells terribly, but I guess they don't.

Cooley: Well, they do, but not to an intolerable level. You would have thought that the continuous flow system would be sort of like a Waring blender, chew up the erythrocytes and all the blood elements, but apparently they're getting by pretty well.

Lindberg: Pretty amazing. Well, there also were experiments in the old days to try to, well, firstly get cell-free systems that would just oxygenate through the hemoglobin itself. Have you worked at all in those?

Cooley: I have not, but we've been interested in all the problems.

Lindberg: I tried, too, and couldn't get it to work. Another interesting thing for blood bankers was to freeze the blood so that you'd have it for big emergencies. The Navy had a program at Chelsea, Mass, I think it was where you'd use glycerol and take the water out and store it that way and then gradually put the water back in, and it worked perfectly well. I mean it was used in surgery, used in burn treatment, but it was a pretty expensive unit of blood but --

Cooley: Oh, sure. Then some of the blood substitutes have other complications, you know, might encourage post-operative bleeding and coagulation problems and with some of the substitutes, but they do fulfill an --

Lindberg: Emergency.

Cooley: -- immediate problem.

Lindberg: Yeah, well, that's where the team thing comes in. I think one of the things that motivated Joshua Lederberg was he wanted young people going into science, and he was prepared to say if you want to know how to -- I got a Nobel Prize. I'll tell you. Well, they haven't managed to get a Nobel Prize to a surgeon yet. I regret that, but maybe in the same spirit you'll tell us a few things that young viewers ought to hear.

Cooley: Well, I don't think that the Nobel Prize would be appropriate for anybody in clinical surgery. I think that that belongs to people involved in basic science.

Lindberg: Well, apparently. I guess so.

Cooley: Alexis Carrel, he received the Nobel Prize about 1912, and from then on it was a big conflict that his associate, Dr. Guthrie had done most of the work.

Lindberg: Well, it certainly wasn't for producing a wonderful oxygenating device.

Cooley: They found that they had to back away from clinicians to award the prize.

Lindberg: I recall as a youngster that I was sort of surprised, and I guess he too, that [Jonas] Salk was not so rewarded whereas the basic research by [John] Enders of how to grow virus in tissue culture was viewed as the major development.

Cooley: Well, those were the kinds of things of importance --

Lindberg: Big deal.

Cooley: -- for the Nobel Prize, that sort of thing. I know Mike DeBakey rather expected to kind of get the Nobel Prize, and we used to play little pranks and like call up DeBakey with a good --

Lindberg: This is Stockholm.

Cooley: -- Norwegian accent and say -- then hang up. But anyway --

Lindberg: Well, at least there's one man at NIH that I know for a fact kept in his lab, champagne. It was called a case just in case. Just in case they call him, it will be handy and chilled down and ready to join and celebrate. So do you think that surgery is still a good thing for a young man or woman to get in on?

Cooley: Oh, I think so. I think the opportunities are still there and going to always need surgery and the whole spectrum of medicine in the future. And I think we'll probably see some restrictions on delivery of certain types of -- I think the word I'd like to say -- not just cosmetic surgery, but surgery which is unessential. All of the joint replacements we're seeing in the older individuals and so forth there may be some restrictions placed on that.

Lindberg: Do you think there should be? If you need a hip, shouldn't you get a hip?

Cooley: Well, I guess you bring in morality and the whole picture and that.

Lindberg: Well, I was amazed -- I mean because people -- the economists will say -- I can remember when Charnley invented the procedure in London and a couple people from Mayo actually went over and learned it, brought it back to US as I recall, the total hip procedure, and I guess the US would contribute the methyl methacrylate, the DuPont product that -- which they glue them in. And the economists began to say, well, now wait a minute, you're operating on this old lady here. Is she going to go back in the workforce and earn money and pay taxes and all that kind of thing? It was completely the wrong end to look at, because actually what was happening was the old lady or old man from the attic or the basement would have two dozen family members totally wrapped up in her or his pain and disability. So \$10,000 worth of surgery would relieve two dozen otherwise reasonable adults of a tremendous burden. And, of course, there are many such procedures done. So I think we ought to get you a hip.

Cooley: Well, it's difficult to make those kinds of decisions and it's often called upon -- the doctor involved, the surgeon involved has to make the decision. When I spent a year as a registrar in London in 1950 -- and I think the National Health Service had been in existence about a year and a half then -- my chief there who was the most active thoracic surgeon in London would not operate on a patient for lung disease who was over 65 years of age unless it was a private patient. So that's what's going to occur, just like it's occurred in Canada, the recent involvement in the National Health Program. There's going to be a waiting list for a specialist's care. At the time I was in London, and that was in the beginning of the National Health Program, each of my chiefs had at least 200 patients awaiting thoracic surgery. They would only do one or two operations a week on the National Health Program.

Lindberg: They could have done a lot more, though, couldn't they?

Cooley: They could have, but they wouldn't be paid for it.

Lindberg: I see.

Cooley: And they had to support their families and so on. They spent some time doing private practice, too.

Lindberg: Because right now in the US it's still plenty hard to get a patient, even a paying patient with full insurance, to the man you want to have them see.

Cooley: Yes.

Lindberg: I mean, I just had the experience yesterday with a lady in referring, and they want to see her in the end of June. I mean so we get blocked up, too, just by the busy-ness of the profession.

Cooley: Yeah.

Cooley: Well, I just saw a young patient in a talk I gave. I gave the DeBakey lectureship up in Lubbock, Texas. This young lady there said she'd spent her life saying that I had saved her life when she was six or eight years old. She had had a [indiscernible] of the aorta. But anyway, the thing that interested me was she said another thing is that Dr. Cooley waived all of his professional fees at that time, and I like to tell people I never refuse a patient because they couldn't pay the surgical fee and that's patients from all around the world.

Lindberg: Yeah, that's very nice. Of course, the hospital, of course, way, way dwarfed the professional fees.

Cooley: But now with Medicare and these other programs, you can't do that. You can't waive your fee.

Lindberg: Yeah.



Cooley: They might even get you for fraud.

Lindberg: Yeah, I've noticed that.

Cooley: I tell people if I was to operate on my mother and not send her a bill, I might get accused of fraud.

Lindberg: Oh, yeah, you've got to do that, bill the old lady. Well, actually, in the old days in Brooklyn if you wrote a prescription and you put a little 'p' at the lower right-hand corner, then the pharmacist knew this is a poor person, give them the stuff at half price.

Cooley: Really? I didn't know that.

Lindberg: Yeah, and if you wrote 'pp' -- it meant por perisimo [phonetic]. If it's possible, give them samples, make it free. Now, of course, those days have passed, too.

Cooley: That sort of activity is what made our profession considered the noblest of all the professions, and I hope that future doctors will follow that tradition of giving services to the poor as well as the rich.

Lindberg: Yeah, I hope so, too. I'll say something and then you'll correct it or disagree or agree.

It seems to me to make payments so dependent upon procedures, it shouldn't take away from the surgeons, the surgeons that do procedures, but I don't think you've got to get the internist and the pediatricians, everybody doing procedures in order to get paid. Do you?

Cooley: Well, I guess you could look at it two ways. But I agree.

Lindberg: I mean pay them for what they'll do and what it's worth.

Cooley: Yeah.

Lindberg: I talked to the American College of Physicians some years ago just before the big New Orleans flooding, and they said do you want to see this -- I got there a couple hours early -- do you want to see this CME and lifelong learning and all that. I said, sure, of course I do. And what they showed me was very well done but essentially is teaching internists to do biopsies and put needles into joints. Perfectly obvious that that's billable procedures. I mean, I think that's foolishness. I mean in the meantime they don't have time to talk with the patient and explain the disease and make a plan. I mean that's what I'd like to see them paid for. That's what the patients want. I mean they don't mind paying for a needle, but I think we've got --

Cooley: Well, the practice is changing so much. People for a long time lamented the fact that doctors didn't make house calls.

Lindberg: Yeah, that's true.

Cooley: Those in my generation were accustomed to having the doctor come by the house.

Lindberg: Yeah, I've been called on by doctors. Limit to what you can do, though, isn't there?

Cooley: Yeah. Well, that's the old matter of compassion. And doctors have become rather impersonal with patients because the delivery of healthcare is so different. Everybody from our generation remembers the family physician, and thought he was part of your family, almost a blood relative.

Lindberg: Oh, yeah, sure.

Cooley: But that's changed so much now.

Lindberg: Well, there are a couple of new characters in medicine one, the emergency room doctor, two, the intensivist, and then thirdly, you brought up the hospitalist.

Cooley: Yeah.

Lindberg: How is that working? You got any of these folks here in Houston?

Cooley: I think there's some resistance to it by the practicing doctor. We have an open membership for our visiting doctors and we don't have many salaried physicians in the hospital, and it's very difficult now in a place like the Texas Medical Center for the doctors out in the community to come follow their patients, so I think they finally accepted the system up to a point.

Lindberg: So there the issue is the so-called hospitalist then, huh?

Cooley: Yeah. It fulfills a need.

Lindberg: But I'm surprised that you need that in an academic setting. What the heck are residents and fellows? Where do they fit in?

Cooley: That's not sufficient. Nowadays you have to have a certified physician, somebody who is licensed and so on for insurance purposes and legal purposes and so on. So they have to have someone who is more mature than -- you know, when you and I were in the house staff level, we were the doctors of the patients.

Lindberg: Yes, absolutely.

Cooley: They didn't expect to see Dr. Blalock every day and they might see me and they got to thinking that I was their doctor.

Lindberg: Yeah. I've done surveys at the University of Missouri Hospital asking the patients who is your doctor, and they generally thought it was the fourth-year medical student.

Cooley: That's right.

Lindberg: That's what they see. Yeah, but this is just part of the changing way that medicine is practiced, so I guess the impulse to say I don't like change is strong with all of us, but I guess there must be some good changes. I mean, I don't think you were old enough to see the beginnings of anesthesiology, but almost. I mean that must have been reasonably young when you got into medicine.

Cooley: Yeah, even those first operations that we performed on blue babies I had a nurse anesthetist giving --

Lindberg: Open-can ether or what did you use? Chloroform?

Cooley: Well, ether mostly, open-drop ether, but sometimes cyclopropane and some other drugs.

Lindberg: Yeah, the ether if you're not careful can get a good bit of the surgical staff. I do remember that. I didn't ask you about women in surgery. Is it true that women can actually do surgery nowadays?

Cooley: It's hard for me to believe, but I must say that I've been associated with a few very good women surgeons.

Lindberg: Oh, I'm sure you have.

Cooley: And we've had a couple come through our thoracic program here, and they're really superb. Some of the hospitals in the old Soviet Union and so on, they'd have one surgeon and maybe have ten women surgeons who did most of the surgery. But the chief was just responsible for everything going on.

Lindberg: So are the gals applying to surgery residencies now in good numbers or not?

Cooley: Not in good numbers. Not for my type of surgery, but for general surgery they have a substantial number of them and, of course, in medical schools over 50 percent of the admissions are female.

Lindberg: Yes. But apparently it's not channeling yet into surgery in great numbers.

Cooley: No. Most of the women go into less invasive-type of specialties, internal medicine, and dermatology, gynecology and so forth.

Lindberg: Well, I had the privilege of studying as a medical student with Ginny [Virginia] Appgar, and she had been trained in surgery and proposed to get a job in surgery when she came to New York, and they told her to forget about it, but this new thing called anesthesiology, why don't you go figure that out, start that. Of course, she made a great success of it.

So that particular deflection had a good outcome, but she [Apgar] had wanted to do surgery. So again, I think we're at the end of your time, and I don't want to overstep your bounds of cordiality, but is there something, anything else that we ought to hear from you that would benefit youngsters?

Cooley: Well, some of us in surgery have gotten enormous recognition for some new procedure or device, and we were the first to do this, the first to do that, and people ask me what is your most prominent, most favorite contribution, and I say one thing -- I had the opportunity to develop a school of surgery, and my legacy would be the residents and fellows who have had training on my program here, and that will be the lasting thing. Some of the other things will be soon forgotten and some other intrepid surgeons will come along and break some new barriers at my school. That's another thing I've appreciated so much about Johns Hopkins where they have a tradition for training academic surgeons and leaders in surgery and medicine throughout the country.

Lindberg: They do. So have you.

Cooley: Yeah.

Lindberg: Well, that's great. Thank you very much.

Cooley: Thank you.

Lindberg: I appreciate the time.